	Type	Hits	Search Text
1	BRS	3	"6713206".pn.
2	BRS	5196	429/12,13,17,38.ccls.
3	BRS	1	10/609,017 and multistream
4	BRS	0	S1 and multistream
5	BRS	6	multistream adj laminar adj flow
6	BRS	2	S5 and (current adj density)
7	BRS	3	S5 and current
8	BRS	3	S5 and (alcohol and oxygen)
9	BRS	2	S8 and (platinum ruthenium)
10	BRS	2	S9 and electrode
11	BRS	2	S10 and pump

	DBs
1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
5	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
6	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
7	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
8	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
9	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
10	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
11	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT

	Type	Hits	Search Text
12	BRS	2044	direct adj methanol adj fuel adj cell
13	BRS	1039	S12 and "429"/$.ccls.
14	BRS	293	S14 and @ad<"20020114"
15	BRS	31	S15 and (sensor same concentration) and pump
16	BRS	186	"4" and (sensor same concentration) and pump and (inejctor ejector)
17	BRS	0	"20030003336" and (sensor same concentration) and pump and (inejctor ejector)
18	BRS	1	"20030003336" and (sensor same concentration) and pump
19	BRS	1	"20030003336" and (injector reservoir)
20	BRS	2044	direct adj methanol adj fuel adj cell
21	BRS	2044	direct adj methanol adj fuel adj cell
22	BRS	1039	S22 and "429"/$.ccls.

	DBs
12	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
13	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
14	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
15	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
16	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
17	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
18	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
19	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
20	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
21	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
22	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT

	Type	Hits	Search Text
23	BRS	293	S23 and @ad<"20020114"
24	BRS	31	S24 and (sensor same concentration) and pump
25	BRS	0	S25 and (oxidant adj (reservoir injector))
26	BRS	4	S21 and (oxidant adj (reservoir injector))
27	BRS	7	S21 and ((oxidant air oxygen) adj (reservoir injector))

	DBs
23	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
24	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
25	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
26	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT
27	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT

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=> s multistream laminar flow
           129 MULTISTREAM
             1 MULTISTREAMS
           130 MULTISTREAM
                 (MULTISTREAM OR MULTISTREAMS)
         32441 LAMINAR
             7 LAMINARS
         32445 LAMINAR
                 (LAMINAR OR LAMINARS)
        826068 FLOW
         84166 FLOWS
        863448 FLOW
                 (FLOW OR FLOWS)
L1           7 MULTISTREAM LAMINAR FLOW
                 (MULTISTREAM(W)LAMINAR(W)FLOW)

=> d l1 abs ibib 1-7
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L1 ANSWER 1 OF 7 CAPLUS

AB This paper exptl. quantifies the reorientation of the liquid-liquid interface between fluids of different densities flowing side-by-side in pressure-driven laminar flow in microchannels. A gravity-induced pressure mismatch at the interface will gradually drive the denser fluid to occupy the lower portion of the microchannel. The rate of this process is expected to depend on the interplay of viscous forces-which tend to dominate at the microscale-and inertial and gravitational forces. A correlation that relates the position of such a liquid-liquid interface to phys. variables and channel dimensions was derived. The extent of reorientation of the streams was then related to two dimensionless nos.: Froude number (Fr), the square root of the ratio of inertial to gravitational forces; and Re/Fr2, the ratio of gravitational to viscous forces, where Re is the Reynolds number Further anal. showed that the reorientation of the streams depends only on the gravitational and viscous forces, but not inertia. The quant. description of the position of the interface between liqs. of different densities described in this paper aids in the rational design of the rapidly growing number of microchem. systems that utilize **multistream laminar flow** for performing spatially resolved chemical and biol. inside microfluidic channels.

ACCESSION NUMBER:	2005:1144717 CAPLUS
DOCUMENT NUMBER:	144:8557
TITLE:	Gravity-induced reorientation of the interface between two liquids of different densities flowing laminarly through a microchannel
AUTHOR(S):	Yoon, Seong Kee; Mitchell, Michael; Choban, Eric R.; Kenis, Paul J. A.
CORPORATE SOURCE:	Department of Mechanical & Industrial Engineering, University of Illinois at Urbana-Champaign, Urbana, 61801, USA
SOURCE:	Lab on a Chip (2005), 5(11), 1259-1263 CODEN: LCAHAM; ISSN: 1473-0197
PUBLISHER:	Royal Society of Chemistry
DOCUMENT TYPE:	Journal
LANGUAGE:	English
REFERENCE COUNT:	28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 2 OF 7 CAPLUS

AB The invention disclosed herein relates to fuel cell and electrochem. cells having internal **multistream laminar flow** and, more specifically, to microfluidic fuel cell and electrochem. cells having two or more adjacent and cross-flowing (i.e., non-parallel) laminar flow streams positioned within an electrode pair assembly. In one embodiment, an electrochem. cell is disclosed that comprises: a first electrode; a second electrode that opposes the first electrode; and a channel or plenum interposed between and contiguous with at least a portion of the first and second electrodes. The electrochem. cell of this embodiment is configured such that a first fluid enters the channel or plenum and laminarly flows adjacent to the first electrode in a first flow

direction, and a second fluid enters the channel or plenum and laminarly flows adjacent to the second electrode in a second flow direction, wherein the first and second flow directions are different from each other.

ACCESSION NUMBER: 2005:348873 CAPLUS
DOCUMENT NUMBER: 142:395133
TITLE: Fuel cells having cross directional laminar flow streams
INVENTOR(S): Wine, David W.; Ohlsen, Leroy J.
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 23 pp. CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 2005084737	A1	20050421	US 2004-892876		20040716
PRIORITY APPLN. INFO.:			US 2003-513248P	P	20031020

L1 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN

AB A fuel cell is described that includes (a) a first electrode; (b) a second electrode; and (c) a channel contiguous with at least a portion of the first and the second electrodes. When a first liquid is contacted with the first electrode, a second liquid is contacted with the second electrode, and the first and the second liqs. flow through the channel, a **multistream laminar flow** is established between the first and the second liqs. Electronic devices containing such electrochem. cells and methods for their use are also described.

ACCESSION NUMBER: 2004:310718 CAPLUS
DOCUMENT NUMBER: 140:324224
TITLE: Fuel cells comprising laminar flow induced dynamic conducting interfaces
INVENTOR(S): Markoski, Larry J.; Kenis, Paul J. A.; Choban, Eric R.
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 25 pp., Cont.-in-part of U.S. Pat. Appl. 2003 134,163. CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 2004072047	A1	20040415	US 2003-609017		20030627
US 2003134163	A1	20030717	US 2002-53187		20020114
US 6713206	B2	20040330			
WO 2005004262	A2	20050113	WO 2004-US20597		20040625

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.:	US 2002-53187	A2 20020114
	US 2003-609017	A2 20030627

L1 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN

AB Microfluidic fuel cell systems having two or more adjacent and parallel laminar flow streams positioned within an electrode pair assembly are disclosed herein. In one embodiment, a liquid fuel/electrolyte mixture and a

liquid oxidant/electrolyte mixture are interposed between an anode structure and a cathode structure such that the liquid fuel/electrolyte mixture defines a first laminar flow stream that runs adjacent to the anode structure and the liquid oxidant/electrolyte mixture defines a second laminar flow stream that runs adjacent to the cathode structure. The anode structure may in some embodiments be derived from a first substantially planar substrate that is processed so as to have one or more discrete anodic porous regions, where each region is adapted to flow a first liquid therethrough. Similarly, the cathode structure may in some embodiments be derived from a first substantially planar substrate that is also processed so as to have one or more discrete cathodic porous regions, where each region is adapted to flow a second liquid therethrough. In still further embodiments, a third laminar flow stream that comprises a liquid electrolyte mixture flows in between the first and second laminar flow streams.

ACCESSION NUMBER: 2004:252048 CAPLUS
DOCUMENT NUMBER: 140:256333
TITLE: Fuel cell systems having internal **multistream laminar flow**
INVENTOR(S): Ohlsen, Leroy J.; Mallari, Jonathan C.
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004058217	A1	20040325	US 2002-251518	20020920
WO 2004027891	A2	20040401	WO 2003-US21214	20030702

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 2002-251518 A 20020920

L1 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN

AB A series of pressure-sensitive microfluidic gates to regulate liquid flow have been successfully fabricated by patterning surface free energies inside microchannels using self-assembled monolayers in combination with either **multistream laminar flow** or photolithog. The designs are based on the principles of surface-directed liquid flow previously reported. Aqueous liqs., including protein solns., are confined to the hydrophilic pathways (or the most hydrophilic pathway) under spontaneous flow conditions and flow into the hydrophobic regions or the less hydrophilic pathways when pressures exceed critical values. A programmable pressure-sensitive liquid delivery device is demonstrated. The authors also investigated the initial rate of liquid flow in surface-patterned microchannels under spontaneous flow conditions from both anal. and exptl. approaches. The methods described here provide an alternative to the conventional approaches to control liquid flow in the fast-developing field of microfluidic systems.

ACCESSION NUMBER: 2002:855050 CAPLUS
DOCUMENT NUMBER: 138:114957
TITLE: Pressure-sensitive microfluidic gates fabricated by patterning surface free energies inside microchannels
AUTHOR(S): Zhao, Bin; Moore, Jeffrey S.; Beebe, David J.
CORPORATE SOURCE: Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, Urbana, IL, 61801, USA
SOURCE: Langmuir (2003), 19(5), 1873-1879

CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN

AB To direct liquid flow inside microchannels, surface free energies were patterned using self-assembled monolayers (SAMs) in combination with either **multistream laminar flow** or photolithog. For the photolithog. method, 2 photocleavable SAMs were designed and synthesized. Carboxylic acid-terminated monolayers were obtained by photodeprotection, which was confirmed by contact angle and XPS. Using either of these patterning methods, aqueous liqs. flow only along the hydrophilic pathways when the pressure is maintained below a critical value; the liqs. are referred to as being confined by virtual walls. Several principles of liquid flow in surface-patterned channels were derived anal. and verified exptl. These principles include the maximum pressure that virtual walls can withstand, the critical width of the hydrophilic pathway that can support spontaneous flow, the smallest width of the liquid streams under an external pressure, the critical radius of curvature of turns that can be introduced into the hydrophilic pathway without liquid crossing the hydrophilic-hydrophobic boundary, and the minimal distance for 2 liquid streams to remain separated under the maximum pressure. Exptl. results are in good agreement with the anal. predictions.

ACCESSION NUMBER: 2002:485490 CAPLUS
DOCUMENT NUMBER: 137:175408
TITLE: Principles of Surface-Directed Liquid Flow in Microfluidic Channels
AUTHOR(S): Zhao, Bin; Moore, Jeffrey S.; Beebe, David J.
CORPORATE SOURCE: The Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, Urbana, IL, 61801, USA
SOURCE: Analytical Chemistry (2002), 74(16), 4259-4268
CODEN: ANCHAM; ISSN: 0003-2700
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
REFERENCE COUNT: 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN

AB Self-assembled monolayer chemical was used in combination with either **multistream laminar flow** or photolithog. to pattern surface free energies inside microchannel networks. Aqueous liqs. introduced into these patterned channels are confined to the hydrophilic pathways, provided the pressure is maintained below a critical value. The maximum pressure is determined by the surface free energy of the liquid, the advancing contact angle of the liquid on the hydrophobic regions, and the channel depth. Surface-directed liquid flow was used to create pressure-sensitive switches inside channel networks. The ability to confine liquid flow inside microchannels with only two phys. walls is expected to be useful in applications where a large gas-liquid interface is critical, as demonstrated here by a gas-liquid reaction.

ACCESSION NUMBER: 2001:115696 CAPLUS
DOCUMENT NUMBER: 134:271602
TITLE: Surface-directed liquid flow inside microchannels
AUTHOR(S): Zhao, Bin; Moore, Jeffrey S.; Beebe, David J.
CORPORATE SOURCE: The Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, Urbana, IL, 61801, USA
SOURCE: Science (Washington, DC, United States) (2001), 291(5506), 1023-1026
CODEN: SCIEAS; ISSN: 0036-8075
PUBLISHER: American Association for the Advancement of Science
DOCUMENT TYPE: Journal
LANGUAGE: English

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT